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NEW USSR DATA ON THE PHARMACOLOGY
 OF CHOLINESTERASE INHIBITORS

Prof N. Lazarev
 Hon. Worker of Sci

The great physiologist I. P. Pavlov attached great importance to the recognition of the chemical nature of nervous processes. "It can hardly be disputed," he wrote, "that only the study of physicochemical processes taking place in the nerve tissue can give us a real theory of all nervous phenomena."

Following this statement, the collectives of physiological laboratories, under the direction of A. F. Samoylov, K. M. Bykov, and A. V. Kibyakov, attained new successes in the study of the chemical nature of nerve excitation. Their studies clarified the extremely important role of acetyl choline in processes of nerve excitation in the vegetative and central nervous systems.

At present, it can be considered as established that at least three mechanisms, very closely connected with acetyl choline, take part in the birth act. First, the vegetative nerves of the uterus secrete this substance. Second, its presence is essential for transmission of the stimulus for one nerve cell to another (regulation of the birth act by the central nervous system). Finally, the hypophysis gland, which secretes the most important birth-stimulating hormone oxytocin, also has cholinergic innervation.

It is natural to assume that disturbance of normal functions of the cholinergic processes of these nerve mechanisms can result in a pathological course of the birth act.

We had the opportunity to verify this assumption in our laboratory in the course of experiments conducted by the method of experimental therapy. M. A. Rozin and K. V. Tsomaya produced artificial paralysis in guinea pigs by poisoning them with tricresyl phosphate. This substance poisons cholinesterase, an enzyme which destroys acetyl choline under normal conditions. As a result of the inactivation of cholinesterase, an excessive accumulation of acetyl choline is produced. In all guinea pigs, without exception, which had been pregnant at

- 1 -

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the beginning of the experiment, tricesyl phosphate poisoning caused miscarriages. The reason for this was excessive accumulation of acetyl choline in the nerve structures which control the motor actions of the uterus.

This observation suggested to Prof M. Ya. Mikhel'son the possibility of using substances which inhibit cholinesterase, in particular proserine, as birth accelerators.

Prof Mikhel'son's method was tested by Dr Z. A. Drozdova at the Lying-In and Gynecological Clinic of the Naval Medical Academy and by Dr A. V. Savshinskaya at the Clinic of the Chair of Obstetrics and Gynecology of the Leningrad Sanitation and Hygiene Medical Institute.

Experience confirms the assumption that proserine is extremely effective in definite weakness or complete absence of birth activity of the uterus, and is also a prophylactic in those cases in which drugs having a depressing effect on labor had been administered to produce anesthesia.

The lying-in patient is given powders containing 0.003 [grams] of proserine every hour, until birth sets in and labor has increased to such a point that further administration of proserine is no longer necessary. A total of eight powders may be administered. Generally, labor increases already after the administration of one or two doses. However, administration of proserine should not be discontinued until the lying-in patient has been given four powders.

The theoretical foundations and the results of the practical tests of the birth acceleration method were reported by Prof M. Ya. Mikhel'son, Z. A. Drozdova, and A. V. Savshinskaya at the joint meeting of the Pharmacology and Toxicology Section of the Leningrad Physiologists' Society imeni I. M. Sechenov and the Leningrad Obstetricians and Gynecologists' Society. As the data of the authors' report show, proserine showed itself effective in 96 percent of cases of weak labor. Furthermore, in 88 percent of cases the results were evaluated as very good: proserine sharply increased the contraction activity of the uterus and led to quick and safe delivery.

According to the data of the Obstetrics and Gynecology Institute of the Academy of Medical Sciences USSR, the use of proserine in births under anesthesia not only prevents depressing effects on labor, but also permits accelerated and painless birth.

The clinical case histories collected up to now prove that the proserine method of birth acceleration surpasses all other methods in effectiveness, that it is incomparably more simple than the other methods in application, and that it is absolutely harmless, both for the mother and for the infant.

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- 2 -

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